

Remarks

Claims 143-155, 167-193 and 196-232 are pending.

Claims 227-232 have been added.

Support for the new claims is in the published application US 2002/0137269 throughout the description, for example:

- At paragraph [0006] ("...facets on the crystal having different orientations i.e., (100), (110), (111)...");
- At paragraphs [0008] ("...and a top horizontal surface, preferably defining a facet having a (100) plane orientation.");
- At paragraph [0033] ("...thin epitaxial layers comprising a single silicon crystal with a facet having a plane orientation of (100), (110) or (111) on its upper or top surface, preferably a plane orientation of (100)...");
- At paragraph [0035] ("grown until a facet is formed on the top surface 38a. The facet surface can be a (100), (110) or (111) plane orientation, with a (100) plane orientation preferred...")
- At paragraph [0038] ("In general, the semiconductive wafer is introduced into a growth chamber and transferred onto a heated susceptor. The wafer is heated ...The silicon-comprising precursor gas(es) are introduced into the growth chamberor at a pressure ...to control facet growth at a lower rate of less than 20 nm/minute...*This provides control of layer thickness and formation of crystalline facets (100), (111) or (111) on the top surface of the epitaxial layers...*"") (Emphasis added).

No new matter is added with the addition of the new claims, which are intended to merely clarify language used in the claims and/or the subject matter claimed. The scope of the claims is intended to be the same after the amendment as it was before the amendment.

Rejection of Claims under 35 U.S.C. §§ 102(b)/103(a) (Matsumoto)

The Examiner maintains the rejection of the claims, as follows:

- a) Claims 225-226 under Section 102(b) as anticipated by JP 401286361 (Matsumoto);
- b) Claims 143-144, 147, 149-153, 167, 169-170, 172-173, 175-176, 178-179, 181-193, and 196-223 under Section 102(b) as anticipated by or, in the alternative, under Section 103(a) as obvious over Matsumoto;
- c) Claims 145-146, 148, 154-155, 168, 171, 174, 177, and 180 under Section 103(a) as obvious over Matsumoto in view of USP 5,483,094 (Sharma); and
- d) Claim 224 under Section 103(a) as obvious over Matsumoto in view of USP 5849077 (Kenney).

These rejections are respectfully traversed.

Applicant believes that these rejections are in error because:

- 1) The Examiner has failed to fully consider Applicant's arguments.
- 2) The Examiner has mischaracterized the disclosure of *Matsumoto* – *Matsumoto's disclosure does not support the Examiner's rejection;*
- 3) *Matsumoto does not describe multiple epitaxial layers;*
- 4) *The combination of Matsumoto with Sharma's disclosure does not result in Applicant's devices as claimed; and*
- 5) *The combination of Matsumoto with Kenney's disclosure does not result in Applicant's devices as claimed.*

1) The Examiner has failed to fully consider Applicant's arguments.

Applicant has clearly set forth arguments in a previous reply and the Examiner has failed to address those arguments.

The Examiner checked "Box 11" of the Advisory Action mailed October 11, 2006, stating as follows (emphasis added):

11. The request for reconsideration has been considered but does NOT place the application in condition for allowance because: See Continuation Sheet.

...The Applicant arguments have been fully considered but they are not persuasive.

The Examiner has failed to fully address Applicant's traversal of the rejections of the claims.

The Examiner is respectfully directed to MPEP 707.07 (f), which states as follows (emphasis added):

700 Examination of Applications

707.07(f) Answer All Material Traversed [R-3]

In order to provide a complete application file history and to enhance the clarity of the prosecution history record, *an examiner must provide clear explanations of all actions taken by the examiner during prosecution of an application.*

Where the requirements are traversed, or suspension thereof requested, the examiner should make proper reference thereto in his or her action on the amendment.

Where the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it.

¶ 7.37 *Arguments Are Not Persuasive*

Applicant's arguments filed [1] have been fully considered but they are not persuasive. [2]

Examiner Note

1. The examiner must address all arguments which have not already been responded to in the statement of the rejection.

2. In bracket 2, provide explanation as to non-persuasiveness.

First, in response to the Examiner rejection of the claims based on Matsumoto, Applicant stated as follows (Response dated October 2, 2006, at page 4):

The Examiner is requested to provide the written text in Matsumoto that describes a second SEG layer.

The Examiner has failed to provide a response to Applicant's argument.

The Examiner has repeatedly asserted that Matsumoto illustrates two separate epitaxial layers, stating as follows (emphasis added)

...Matsumoto is clearly show two separate epitaxial layers 4 and 6 as shown in fig. 3(b)....

Applicant has repeatedly argued and shown in the Abstract of Matsumoto and in Fig. 3(b) that area 6 is not a second SEG layer. SEG area 4 is formed – and then doped, resulting in doped area 6.

The Examiner has incorrectly interpreted Fig. 3(b).

The Examiner has ignored Matsumoto's description/discussion of the doping of SEG area 4 to form doped area 6 – and has failed to provide any support in the text of Matsumoto for his assertion regarding the teaching of this reference.

2) **The Examiner has mischaracterized the disclosure of Matsumoto – Matsumoto's disclosure does not support the Examiner's rejection.**

In response to Applicant's arguments, the Examiner stated as follows (Final Office Action mailed 08-02-06, at pages 9-10 (emphasis added):

a) The Applicant argues that Matsumoto does not describe at least two overlying layers of epitaxial silicon because base area 6 is not a separate layer; it is part of SEG area 4. This is not persuasive because Matsumoto is clearly show two separate epitaxial layers 4 and 6 as shown in fig. 3(b)....

The Examiner erroneously asserts that element 6 in Fig. 3(b) is a second epitaxial layer.

The Examiner is directed to Fig. 3(b) and the Abstract of Matsumoto, which clearly states that there is only one SEG layer 4.

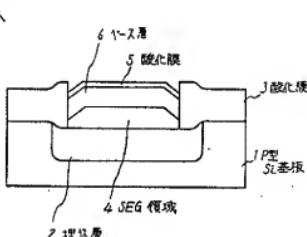


FIG. 3(b)

Abstract of JP1286361

CONSTITUTION: ...a phosphorous doped N type SEG (selective epitaxial growth) area 4 is grown. And an oxide film 5 is grown on the SEG area 4. Next, an insulation film 8 is formed by a rotary application method. Since applied film is formed thick on a facet 7 at the corner part of the SEG area 4 this way and the entire surface of the SEG area 4 is planed, if boron is implanted by an ion implanting method, uniform base 6 is formed. ...

The abstract states that IF boron is implanted – uniform base 6 is formed.

Base area 6 is formed by doping the existing SEG area 4. Area 6 is not a second SEG layer.

There is only one layer of SEG that is formed – which is **SEG area 4**.

The Examiner has misinterpreted the figure. The Examiner's position is clearly erroneous with no support in Matsumoto's text.

The Examiner is again requested to provide the written text in Matsumoto that describes a second SEG layer.

Matsumoto does not teach or suggest Applicant's devices as claimed. Withdrawal of this rejection is respectfully requested.

3) Matsumoto does not describe multiple epitaxial layers.

In the Office Action at page 10, the Examiner further stated (emphasis added):

...In addition, as layer 4 being deposited on the substrate 1, it would have comprising *multiple* sub-layers that would constitute for layer 4. Thus the final structure would be a *continuous* epitaxial layer with a desired thickness. Furthermore, making integral, separable or continuous would have been obvious...

The Examiner's statement is contradictory. The Examiner seems to argue that layer 4 is composed of *multiple* layers – but, at the same time, is a *single continuous* layer.

Matsumoto describes layer 4 as follows (Abstract, emphasis added):

...A window is opened inside the buried layer 2, and a phosphorous doped N type SEG (selective epitaxial growth) area 4 is grown....

Matsumoto describes layer 4 as being grown within the opening in layer 2.

Matsumoto does not describe layer 4 as composed of multiple layers.

4) The combination of Matsumoto with Sharma's disclosure does not result in Applicant's devices as claimed.

The Examiner rejected dependent Claims 145-146, 148, 154-155, 168, 171, 174, 177, and 180 based on the combination of Matsumoto with Sharma.

The Examiner cites Sharma for teaching an *insulative layer 41/61* composed of silicon oxide and/or silicon nitride, citing to col. 5, lines 29-32, and to col. 8, line 32. The Examiner also cites Sharma for teaching a dielectric layer having a 2-5nm thickness.

This information from Sharma does not overcome the failure of Matsumoto to teach a device having *multiple* overlying epitaxial silicon layers. This information from Sharma combined with Matsumoto's structure does not result in Applicant's devices.

Matsumoto – either alone or combined with Sharma, does not teach or suggest Applicant's devices as claimed. Withdrawal of this rejection is respectfully requested.

5) **The combination of Matsumoto with Kenney's disclosure does not result in Applicant's devices as claimed.**

The Examiner rejected dependent Claim 224 based on the combination of Matsumoto with Kenney. Dependent Claim 224 further defines the structure of Claim 143 wherein *each* of the epitaxial silicon layers defines a facet having a (100) plane orientation.

The Examiner cites Kenney for disclosing a top surface of *at least one* epitaxial silicon crystal 19 as defining a facet having a (100) plane orientation.

This information from Kenney does not overcome the failure of Matsumoto to teach a device having *multiple* overlying epitaxial silicon layers.

Matsumoto – either alone or combined with Kenney, does not teach or suggest Applicant's devices as claimed. Withdrawal of this rejection is respectfully requested.

In sum, Matsumoto, either alone or in combination with the secondary references, does not teach or suggest Applicant's devices as claimed.

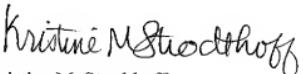
Accordingly, withdrawal of these rejections is respectfully requested.

Extension of Term. The proceedings herein are for a patent application and the provisions of 37 CFR § 1.136 apply. Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that Applicant has inadvertently overlooked the need for a petition for extension of time. If any extension and/or fee are required, please charge Account No. 23-2053.

Claim Fees. If fees are due for the added claims, please charge the required fees to Account No. 23-2053.

It is submitted that the present claims are in condition for allowance, and notification to that effect is respectfully requested.

Respectfully submitted,



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